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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,504	12/28/2001	Woo Seock Cheong	CU-2759	1255

26530 7590 06/02/2004  
LADAS & PARRY  
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CHICAGO, IL 60604

EXAMINER

GARCIA, JOANNIE A

ART UNIT PAPER NUMBER

2823

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/034,504

Applicant(s)

CHEONG, WOO SEOCK

Examiner

Joannie A Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,8,14,17,18 and 20 is/are rejected.
- 7) ☒ Claim(s) 2-7,9-13,15,16,19 and 21-25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, and 8, are rejected under 35 U.S.C. 102(b) as being anticipated by Hada et al (U.S. Patent 6,030,894).

The rejection is maintained as stated in the Office Action mailed 11-15-02, and as stated below.

Applicant argues that the plug of Hada et al is not found on the surface of the walls of the contact hole, but is completely filling the contact hole. However, the claims are not so limited. Hada et al discloses forming a selective conductive plug 116/157 in the contact hole 107 having the silicon layer 155 (Figure 2B), as recited in claim 1, line 6. Furthermore, Hada et al discloses forming the selective conductive plug 116/157 on the surface of the walls of the contact hole 107 (Figure 2B).

Claims 1, 14, and 18, are rejected under 35 U.S.C. 102(e) as being anticipated by Chiang et al (U.S. Patent 6,383,863).

The rejection is maintained as stated in the Office Action mailed 11-15-02, and as stated below.

Applicant argues that although Chiang et al discloses a surface layer, it is an amorphous silicon layer. However, as recited in claim 14, Chiang et al discloses forming a doped amorphous silicon layer 15 on the surface of the contact hole (Figure 5, and Column 4, lines 4-9).

Applicant argues that Chiang et al does not teach forming a contact plug after and over the silicon layer. However, Chiang et al discloses forming a doped amorphous silicon layer 15 on the surface of contact hole 14a (Figure 5, and Column 4, lines 4-9), and forming a selective conductive plug in the contact hole having the silicon layer (Figure 6, and Column 4, lines 25-31), therefore, achieving formation of a contact plug after and over the silicon layer.

Claims 17 and 20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al as applied to claims 1, 14, and 18 above, and further in view of the following comments.

The rejection is maintained as stated in the Office Action mailed 11-15-02, and as stated below.

Chiang et al discloses that the doped amorphous silicon layer is deposited using  $\text{SiH}_4$  (Column 4, lines 7-9). Chiang et al does not disclose that doping concentration of silicon is between 1 and  $2 \times 10^{20}$  atom/cc, and that the thickness of the amorphous silicon layer is between 50 and 150 angstroms. It would have been a matter of routine optimization to determine a suitable doping concentration and a suitable thickness within the teachings of Chiang et al to achieve desired device properties of the device produced. One of ordinary skill in the art would have been motivated to arrive at the recited concentration through routine experimentation to achieve desired device properties of the device produced.

Notwithstanding, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it

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appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Claims 2-7, 9-13, 15, 16, 19, and 21-25, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956 until 2/4/04. See MPEP 203.08.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Joannie Adelle García whose telephone number is (571) 272-1861. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax number for this group is 703-872-9306 for before final submissions, 703-872-9306 for after final submissions and the customer service number for group 2800 is (703) 872-9317. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.



JAG

May 18, 2004

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